

REMARKS

The Final Office Action issued 23 October 2003 has been reviewed and the comments of the U.S. Patent and Trademark Office have been considered. Claim 1 has been amended. Claims 3-5 were canceled without prejudice or disclaimer in the Amendment filed 18 August 2003. Claims 6-9 and 20 were canceled without prejudice or disclaimer in the respective amendments filed August 09, 2001 and May 06, 2002. Claims 10-19 have been allowed. Claims 21-23, pursuant to a restriction requirement issued 20 December 2002, have been canceled without prejudice or disclaimer. Accordingly, applicants request reconsideration of the pending claims 1, 2, and 10-19.

Applicants thank the Examiner for indicating that claims 10-19 have been allowed.

The drawings stand objected due to various informalities of Figures 4A and 4B. Submitted herewith is a replacement sheet with formal drawings of Figures 4A and 4B. Accordingly, the objection to the drawings has been overcome and should be withdrawn.

Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Daly. Insofar as the rejection is applicable to amended claim 1, applicants respectfully traverse because Daly fails to teach or suggest the claimed invention as a whole.

Amended claim 1 recites a direct injection fuel injector that includes, *inter alia*:

- (1) a circumferential portion of the seat that extends along the longitudinal axis within the body is contiguous to the interior surface of the body;
- (2) each of a guide disk and flat disk has a first surface generally parallel to a second surface extending from an outer perimeter to a central aperture of respective disks; and
- (3) the flat disk has a central aperture and an equal number of apertures axially in-line with the apertures in the guide disk. The flat disk has a slot extending from each of said angularly spaced apertures tangentially to said central aperture so that the seat with the swirl generator forms a fluid tight assembly as fuel flows through the apertures in the guide disk and is metered and directed in a tangential direction to the central aperture in the flat disk.

Support for this amendment to claim 1 is provided by the specification at, for example, page 6, line 25, and in Figures 4A and 4B, as amended on September 13, 2002.

First, Daly fails to teach or suggests a seat with a circumferential portion disposed within a nozzle directly connected to the interior surface of the nozzle. In particular, Daly states that a seat 26 has a circular hole 28 for fuel to flow through. The seat 26 of Daly has a circumferential portion spaced from the inner surface of nozzle 12 with a polymeric member (e.g., an O-ring). The polymeric member apparently provides for a seal between the inner surface of the nozzle 12 and the circumferential portion of seat 26. Thus, Daly fails to teach or suggest a circumferential portion of a seat disposed within a body, and directly connected to the interior surface of the body so that the circumferential portion is contiguous to an interior surface of the inner portion, as recited in claim 1. Accordingly, claim 1 is patentable for at least this reason because Daly fails to teach or suggest this feature of the claimed invention as a whole.

Second, the member 18 of Daly has a first surface facing an inlet 14 and a second surface facing a frustoconical surface of seat 26; the second surface has a surface between an outer perimeter and a central aperture oblique to the first surface. Because Daly employs a surface oblique to the first surface of member 18, Daly fails to teach or suggest first and second generally parallel surfaces extending from the outer perimeter to a central aperture of each of a guide disk and flat disk. Accordingly, claim 1 is patentable over Daly for at least this reason.

Third, Daly also fails to teach or suggests a swirl generator that has a guide disk and a flat disk, i.e., two separate members, and each of the two separate members has a first surface generally parallel to a second surface extending from an outer perimeter to a central aperture. Nor does Daly teach or suggest a flat disk with a central aperture and an equal number of apertures axially in-line with the apertures in the guide disk with a slot extending from each of said angularly spaced apertures tangentially to said central aperture so that the seat with the swirl generator forms a fluid tight assembly as fuel flows through the apertures in the guide disk and is metered and directed in a tangential direction to the central aperture in the metering disk.

The Examiner cites *Nerwin v. Erlichman*, 168 USPQ 177, 179 (BPAI 1969) for the proposition that the modification of an integral piece into multi-piece is routine skill in the art and would “ease manufacturing.” Applicants respectfully assert that the Examiner has not appropriately applied *Nerwin* to support this rejection. In *Nerwin*, the Board qualified this proposition as dependent upon the reasons for changing a single element into multiple elements, i.e., the functions that are necessary for such modification from a single element to several

elements; “[W]e are of the opinion that while a given structure may in one sense be considered a single element, in another sense it may be so formed as to consist of several elements depending upon the functions to be performed by such elements.” (emphasis added). *Nerwin* at 179. And the reason for making the single element into multiple elements must be supported by evidence under the U.S. Supreme Court case of *Graham v. Deere*. Here, the Examiner has not given any reason why the modification of a single element of Daly into multiple elements would “ease manufacturing,” especially when an increase in the number of parts tends to result in more complex manufacturing. That is, the proposed modification would result in an increase in the number of parts (i.e., by the substitution of a one-piece member with a two-piece member) and could increase the number of steps required to assemble or manufacture such fuel injector. Hence, if the number of steps of assembly is the basis for evaluating the difficulty in manufacturing, the increase in the number of steps could make the manufacturing of such injector harder instead of easier. Thus, applicants respectfully request that the Examiner provides a basis to support the proposed modifications to Daly or provides some objective teaching for such modification, in accordance with the Manual of Patent Examining Procedure at page 2100-126 (8th Ed., Rev. 1, Feb. 2003 2001). Accordingly, claim 1 is patentable over Daly for at least this reason.

Furthermore, to the extent that the Examiner considers the functional recitation “[*w*hen the body is exposed to operating temperatures of a cylinder of an engine” of claim 1 as capable of being performed by Daly, the Examiner is respectfully reminded that this functional recitation must be evaluated and considered, “[*j*ust like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.]” See, MPEP 2173.05(g), page 2100-206 (8th Ed., Rev. 1, Feb. 2003).¹ That is, when this functional recitation is evaluated and considered in relation to Daly, the conclusion that Daly is capable of performing the same function by the Office Action must be supported by an explanation or objective evidence for such conclusion. Because Daly states that the injector sprays fuel towards

¹ The Federal Circuit has recently confirmed that functional recitation must be evaluated and considered as a limitation on the claim. *Acco Brands, Inc., v. Micro Security Devices, Inc.*, 346 F3d 1075, 1078, 68 USPQ2d 1526, 1534 (Fed. Cir. 2003)(citing *K-2 Corp. v. Solomon S.A.*, 191 F3d 1356, 1363, 52 USPQ2d 1001, 1004 (Fed. Cir. 1999)).

an intake valve of an engine (col. 1, lines 43-46), it would be apparent to one of ordinary skill in the art that the body of Daly is not exposed to operating temperatures of an engine. And because Daly provides for a resin or plastic bodied fuel injector, in a preferred embodiment, and does not provide for a metallic cylindrical annulus with an inner diameter that maintains an operative relationship when exposed to operating temperatures of a cylinder of an engine in a direct injection environment, it would be apparent to one of ordinary skill in the art that Daly is not capable of achieving the claimed function. Accordingly, claim 1 is patentable because Daly fails to teach or suggest features of the claimed invention as a whole.

Finally, the Examiner cites *In re Aller*, 105 USPQ 233 (CCPA 1955) to support the assertion that it would have been obvious to determine the numerical value recited in dependent claim 2 as a matter of routine skill. Applicant respectfully submits that the Examiner has mischaracterized the holding of *In re Aller* such that Aller is inappropriate to support the rejection of claim 2.

In *Aller*, the process sought to be patented is identical with that of the prior art, except that *Aller*'s claims specify lower temperatures and higher sulfuric acid concentrations than are shown in the reference. The court held in *Aller* that the discovery of an optimum range of the known process based on routine experimentation was insufficient to merit a patent. Here, the claimed invention is not identical to Daly for the reasons set forth above with respect to claim 1. Since the claimed invention is not identical to Daly, one of ordinary skill in the art would not have been able to discover the claimed numerical value as a matter of routine experimentation to support the rejection of claim 2. That is, at the time the invention was made, there was apparently nothing in the relied-upon prior art identical applicant's claimed invention for such person to experiment therewith. Accordingly, *In re Aller* fails to support the Examiner's assertion that the claimed value recited in claim 2 is a matter of routine skill.

Claim 2 depends ultimately from independent claim 1, is therefore also allowable for at least the same reason as claim 1, as well for reciting additional features.

Applicants respectfully request entry of the amendment because the amendment places the application in condition for allowance or, alternatively, in better form for appeal. Claim 1 has been amended to recite subject matter previously allowed in Ren, which was incorporated by

reference at the filing of this application. Accordingly, applicants respectfully request entry and prompt allowance of the amendment.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request entry, consideration of the application and prompt allowance of the pending claims. Applicants respectfully invite the Examiner to contact the undersigned at (202) 739-5203 if there are any outstanding issues that can be resolved via a telephone conference.

EXCEPT for issue fees payable under 37 C.F.R. §1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. §1.136(a)(3).

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP

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By:


Khoi Q. Ta
Reg. No. 47,300

Customer No. 009629
MORGAN, LEWIS & BOCKIUS LLP
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
202.739.3000